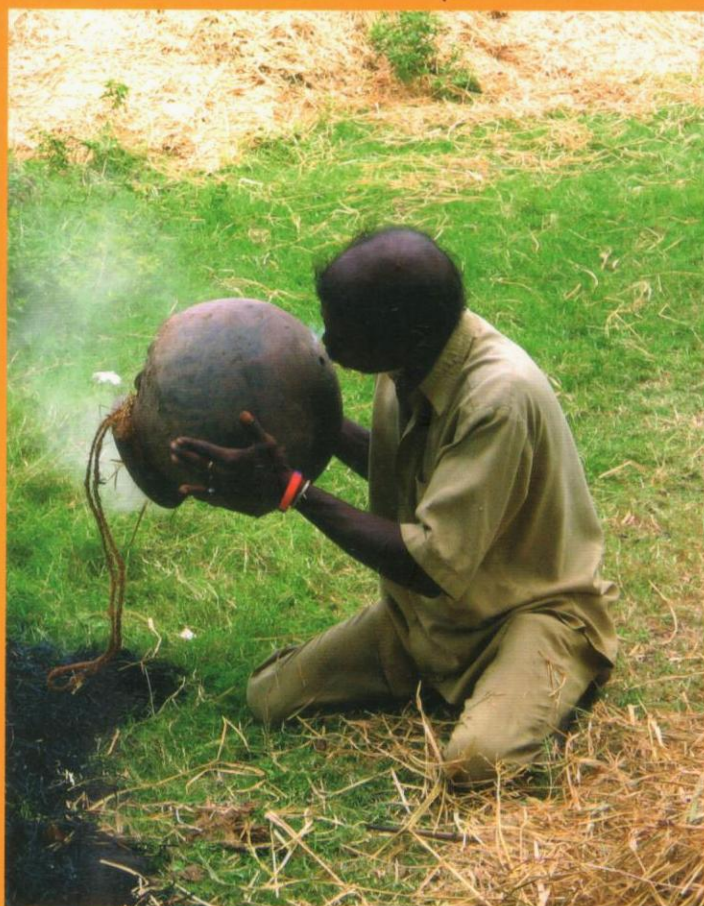


Testing and Validation of Indigenous Knowledge

*The COMPAS experience
from Southern India*



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SECTION III : CIKS EXPERIENCE WITH TRADITIONAL AGRICULTURE

CHAPTER - 10

Rapid Assessment of Traditional Agricultural Practices (RATAP)

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Rationale

Traditional practices have evolved over several hundred years and therefore carry the cumulative wisdom of many centuries. It is not an exaggeration to say that several modern scientific discoveries, especially in India, have their basis in local and traditional knowledge. This knowledge must, therefore, be given its due credit and its contribution to development of science certainly acknowledged.

In India, local knowledge is still extensively used in several sectors including agriculture, animal husbandry, natural resource management (soil, water, land, forests) and health. The practices and techniques have proven to be ecologically sustainable, socially equitable and economically viable. The ability of these practices to provide workable solutions to several problems in these sectors is sufficient testimony to their efficiency and worthiness. Therefore, maintaining a barrier or sharp divide between traditional knowledge/ wisdom and modern scientific temperament would be retrograde and against the basic ethos of science and knowledge development,

However, there is a general tendency among the scientific community to brush aside traditional practices citing lack of systematic documentation and testing procedures. While it is true that all traditional practices cannot be subject to the

same scientific testing procedures and criteria, their efficacy in providing solutions to problems cannot and should not be ignored. What is required is, developing a different set of criteria and codes for validation of this knowledge.

The Rapid Assessment of Traditional Agricultural Practices (RATAP) is one such tool that has been developed by CIKS. This approach evaluates the traditional remedial measures adopted by organic farmers for problems faced by them in agriculture. It involves the participation of farmers, subject specialists, researchers and scientists in a consultative process. The entire process is mediated by CIKS.

Description of RATAP Approach:

The RATAP process itself can be broadly divided into the following stages, each stage following the next sequentially

1. Identification of problems
2. Identification of remedial measures
3. Designing experiments
4. Field testing of experiments

Let us take a more detailed look at each of these stages to get a better understanding of the processes involved.

Identification of Problems

The major stakeholders (in this case, practicing organic farmers) and the mediating body (some staff members of CIKS) meet to discuss and debate the current problems faced by the organic farmers in a particular area, for e.g. organic paddy cultivation. All the problems faced by farmers in this area are listed out. The next step includes assessing the degree of importance as well as the severity level of the identified problem. Based on the experience, opinions and inputs from the stakeholders, a prioritization guideline is developed. Using this guideline, the problems are rated and ranked. Based on this ranking, a set of 3-4 problem areas are selected for further investigation.

Identification of Remedial Measures

Researchers (in our case, the CIKS staff) collect as many remedial measures for these identified problems from various documented sources (journals like LEISA, Honeybee, ITK volumes and texts) and share them with the farmers. Based on a certain set of criteria, a prioritization guideline is again developed to identify which of these remedial practices can be tested. Each of these practices are rated and ranked. As per the ranking value, a set of the most promising 3-4 remedial measures are selected for testing at the field level.

Designing Experiments

A study group consisting of all the stakeholders (in our case - farmers, CIKS staff, scientists /subject specialists and researchers) is constituted, and through a consultative process, designs a testing procedure for each of the selected remedial measures. The involvement of the scientific community in the design of the testing procedures and evaluation parameters ensures that the tests are carried out with the same rigor and discipline as scientific experiments.

Field Testing of Experiments

This is the final step in the evaluation process of indigenous traditional knowledge. Stakeholders (farmers) who are willing to conduct field trials are shortlisted and the experiments are carried out in their fields. There is constant monitoring of the experimental fields by the mediating body (field staff of CIKS) and the entire process is systematically and regularly documented. The results of the field experiments are then compared with the original results as mentioned in the texts or journals. If the tested remedial procedure provides a viable solution to the identified problem, the tests are agreed to be validated and recommended for use by a larger section of stakeholders.

Since June 2007, CIKS has successfully used the RATAP approach for validating the following:

1. Traditional methods of pest and disease control in paddy
2. Evaluating traditional agricultural practices for soil fertility management, *in situ* decomposition of paddy and sugarcane waste
3. SRI method of rice cultivation
4. Cultivation of traditional paddy varieties.

The RATAP process was successfully used by CIKS to find workable solutions for some common, yet major pest and disease problems in paddy cultivation, most of which cause a reduction in yield or in extreme cases even loss of entire crop. The procedure that was followed is explained below.

The RATAP Approach in Practice

A group of 21 farmers (16 men and 5 women) along with CIKS staff and 2 scientists – Dr.S.Arivudainambi (Reader, Department of Entomology, Faculty of Agriculture, Annamalai University) and Dr.Anandan (Sr.Lecturer, Department of Plant Breeding and Genetics, Faculty of Agriculture, Annamalai University) formed a study group and met on June 22, 2007 to evaluate traditional practices for pest and disease management in paddy crop.

Following the discussions and debate within the study group, a prioritization guideline was developed. Based on this guideline, these four problems were considered severe and the cause for poor yield in organic paddy cultivation.

1. Stem borer attack
2. Ear head bug damage
3. Rat damage
4. Bacterial leaf blight.

Farmers were keen on exploring the traditional practices that were followed to control and manage the above mentioned four problems. We shall take up the problem of rat damage as a case study and explore how the RATAP approach has worked in validating some of the traditional methods that have been documented as well as practised for effective control of rat populations.

Control of Rat Damage in Paddy Fields

The problem of rat damage to standing paddy crop has been a major cause for poor yield in conventional paddy fields, and more so in paddy fields that are organically managed. Since the application of rodenticides is strictly forbidden under organic management, alternate methods to check rat populations need to be explored.

What we need to understand is that the explosion in rat population is an indication that natural predator-pest cycles have been disrupted or destroyed and this is partly due to modern agricultural practices. Further, a general decline in the population of natural predators like snakes and owls in agricultural fields, combined with the high breeding ability of rats has only increased the magnitude of the problem. It is therefore necessary to look at this problem in a holistic manner, with an ecosystem perspective rather than in isolation.

The first stage of the RATAP approach – Identification and prioritization of problems – being completed, the second stage – of identifying traditional remedial measures – was initiated. Researchers at CIKS, after careful study of texts, journals and manuals shared with farmers the various traditional practices that were followed to control rat populations in paddy fields. Using the prioritization guideline the following four practices were short-listed for further investigation

1. Management through mantras
2. Indigenous rat control method adopted by the Irula tribe
3. Use of corn flour and cement bait

4. A combination of two methods – the Thanjavur trap method along with the application of an extract of dead rats in cow's urine.

The study group, based on inputs from all the stakeholders designed the experiments for each of these 4 practices and one farmer each was chosen for field trial of these practices.

Management through Mantras

It was during one of the earlier farmers' meet that CIKS farmers had heard about this method of rat control from a scientist working at the Gandhigram Rural Institute, Dindugal. As a follow up to learning about this technique, 17 farmers working with CIKS visited Sekaiyanayakanur, Dindugal, where this practice was effectively being used by farmers to control rat populations. Mr. M. Mahalingam, a farmer from the Allivilagam village, Sirkazhi taluk volunteered to conduct this experiment in one acre of his paddy fields during the *Kuruwai* season of 2007.

The Procedure

It involves collecting sand from areas that are not normally inhabited or accessed by humans. The sand is then put into a container and charmed with mantras for a specific period. This charmed sand is then sprinkled in the paddy field that is infested with rats.

Mr. Mahalingam was not very satisfied with the result of his experiment. However, there is not sufficient data or documentation of the testing procedures and rat damage levels available with this farmer. The experiment therefore needs to be conducted with more rigor, systematic and regular monitoring to either dismiss or validate this technique.

Indigenous Rat Control Method Adopted by the Irula Tribe

The Irula's are a local tribe concentrated in the Chengalpeta region of Tamil Nadu. They are known throughout the region as expert snake and rat catchers. The methods they use are known to be non-chemical and highly effective. Mr. Manikandan of Thennangudi village expressed interest in using the services of Irulas to check rat populations in his 15 acre paddy growing area.

The Procedure

An experienced member of the Irula tribe visited the farmer's field and all rat burrows in the field bunds were identified. All the burrow openings except one were sealed. A pot filled with straw was lit to produce sufficient smoke. The smoke from this pot was directed into the open burrow. Since all the rat tunnels are inter-connected, the smoke directed through the open burrow fumigated all

the burrows. The rats could not escape as all the exit points were sealed and they died due to suffocation within the burrows. At the end of the exercise about 247 rats - including, males, females and juveniles were removed from the burrows. Fumigation is seen as an efficient and chemical-free method of rat control.

As a follow up to this, it was decided to link the Irula Tribal Co-operative Ltd, Chengalpet with the Sirkazhi Organic Farmers Association for collaborative work in managing rat populations in other villages as well. Also efforts to identify Irula tribes in local villages in and around Sirkazhi are underway, so that the two groups could work together to keep rat populations in check.

Use of Corn Flour and Cement Bait

The use of baits for rat control has been in practice for years. However, most of the baits that are available 'off the shelf' are usually laced with highly poisonous chemicals. Mr.R.Manikandan of Agani volunteered to try safer, home-made bait for controlling rats.

The Procedure

Corn flour and cement was mixed in the ratio 3:1 and kneaded with enough quantity of coconut oil into small balls and placed in about 10-15 locations in the field, usually near the rat holes. This was done continuously for about 4-5 days. The farmer observed that the baits were consumed by the rats. The cement in the bait caused reduced feeding among rats that consumed the bait, finally resulting in mortality. This farmer was satisfied with the results of the experiment. However, before large scale application of this measure, it was decided to repeat the experiment in other fields to test for consistency in results.

Combination Method – Thanjavur Trap and Extract of Rats in Cow's Urine

Three farmers from Nemmeli village – Mr.G.Thilagar, Mr.Chelladurai and Mr. Ravichandran and Four farmers from Allivilagam village – Mr.N.Elango, Mr. E.Muralidharan, Mr.Thirugnanam and Mr.M. Mahalingam volunteered to test this practice in their paddy fields.

The Procedure

Traps made of bamboo, and fitted with baits – about 50-60 of them, were strategically placed in the field towards the evening. The next day, all the trapped rats were collected and cut into pieces. The cut rat pieces were then immersed in a pot containing fermented cow's urine. The pot is covered and left to ferment for 7 days, but is opened periodically and stirred using a wooden stick. The stirring enhances the pungency of the emitted odour.

At the end of the fermentation period, the supernatant liquid is filtered and mixed with river sand in the ratio 1 litre of extract : 10 kg of river sand.

The results of this experiment have been inconclusive.

Concluding Remarks

The interaction between humans and the environment is an on-going process and research in this sector has led to the development of a new kind of science called 'Sustainability Science'. This science, besides recognizing that the well being of the human race is dependent on the well being of our natural systems also acknowledges the contribution of traditional knowledge/ practices and local innovations to development of science.

We should, however, take care to distinguish valuable knowledge from myth; this is possible through a process of validation. However the process of validation need not and should not be confined to the strict 'reductionist' approach that is characteristic of western or conventional science. Collaborative research between local people and formally trained scientists would help create knowledge systems that are sustainable, efficient and effective.



Irulas involved in rat management in a paddy field by 'smoke pot method'



Rats caught from the burrows in the paddy fields by fumigation method



During the last ten years the COMPAS partners in India have been involved in wide ranging activities in the area of agriculture, traditional healthcare and natural resources management. The partners have a presence in the Southern states of T'amilnadu, Karnataka and Andhra Pradesh and varying and complementary strengths relating to field work, experimental research, laboratory work and expertise in the traditional literature and scholarship.

This publication provides an overview of efforts undertaken by the COMPAS partners towards testing and validation of indigenous knowledge of health and agriculture. It encompasses varied themes including – local health traditions, ethnoveterinary traditions, bone setting practices and treatment for Malaria in the area of health and characterization of properties of indigenous seed varieties, disease resistance, seed treatment and methodology for rapid assessment of traditional agricultural practices with respect to agriculture. The results have been rich and fascinating and this publication is to share the results of this pilot work with a larger readership.

